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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
DESTA, ELIAS	
ART UNIT	**PAPER NUMBER**
2857	

DATE MAILED: 11/04/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/849,737	Applicant(s) HUANG ET AL.
	Examiner Elias Desta	Art Unit 2857

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *19 September 2003* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-25* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-25* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *04 May 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

Response to Applicant's Amendment

Explanation of Rejection

Claim Objection

1. *Claims 1 and 5* are objected to because of the following minor informality:

   - Claims 1 and 5: "... pertaining to audio data" should read "...measured audio data" since performing an operation on measured data is useful in a practical application and provides a basis for a statutory claim.
   - Claim 5: "... a software module that" should be modified "... a software module of said computer program that ..." the same reason as claim 1 above with changes to relate the module back to program.

Claim rejection – 35 U.S.C. 101

2. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

3. Claims 13-18 are rejected under 35 U.S.C. 101 because of the following reason:

   - Claims 13-16 are non-statutory since the process is not limited to one particular technological art; and

- Claims 13-15, 17 and 18 are presented as an abstract idea without reduction to a practical application.

Claim rejection –35 U.S.C. 112

4. Claims 1-8 and 13-16 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01. The omitted structural cooperative relationships are:

- No defined steps are indicated to form a better realization of the claimed subject matter;
- The outcome is not well defined to show that the subject matter is doing something.

Claim rejection – 35 U.S.C. 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) The invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) do not apply to the examination of this application as the application being examined was not (1) filed on or after November 29, 2000, or (2) voluntarily published under 35 U.S.C. 122(b). Therefore, this application is examined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

6. Claims 1-26 are rejected under 35 U.S.C. 102(e) as anticipated by *Beigi et al.* (U.S. Patent 6,246,982).

In reference to claims 1, 5 and 9: *Beigi et al.* teaches a method of computing a distance measure between multiple mixtures type probability distribution functions (see *Beigi et al.*, Figs. 1-3 and Abstract). The method includes the steps of evaluating a joint distribution function (see *Beigi et al.*, Figs. 4A and 4B, and column 2, lines 32-37). As the sum value of μ_I and γ_k over the range of I=1 to N and k=1 to K equate to a value one is simply showing that the outcome of the sum of probability of events is always one.

With regard to claims 2, 6 and 10: as noted above in claims 1, 5 and 9, *Beigi et al.* further teaches that the first and second mixture probability density functions includes a Gaussian Mixture Model (see *Beigi et al.*, Figs. 4A and 4B).

With regard to claims 3, 7 and 11: as noted above in claims 1, 5 and 9, *Beigi et al.* further teaches that the element distance between the first and second probability

distance functions includes Kullback Leibler Distance (see *Beigi et al.*, column 5, lines 21-34).

With regard to claims 4, 8 and 12: as noted above in claims 1, 5 and 9, *Beigi et al.* further shows that the first and second probability distribution functions are Gaussian mixture models derived from audio segments (see *Beigi et al.*, Fig. 1).

In reference to claim 13: as discussed in claim 1, *Beigi et al.* teaches a method for computing a distance between fist and second mixture type probability distribution functions (see *Beigi et al.*, column 5, line 48 to column 6, line 17). Similar to the claimed invention, *Beigi et al.* shows that W_I^A and W_M^A are the weighted factors in determining the overall distance. Further in Fig. 3, *Beigi et al.* shows that the inner collection distance is a weighted sum of distances between two or more Gaussian mixture probability distribution functions.

With regard to claim 14: as noted above in claim 13, *Beigi et al.* further teaches that the first and second mixture probability density functions include a Gaussian Mixture Model (see *Beigi et al.*, Figs. 4A and 4B).

With regard to claim 15: as noted above in claim 13, *Beigi et al.* further teaches that the element distance between the first and second probability distance functions includes Kullback Leibler Distance (see *Beigi et al.*, column 5, lines 21-34).

With regard to claim 16: as noted above in claim 13, *Beigi et al.* further shows that the first and second probability distribution functions are Gaussian mixture models derived from audio segments (see *Beigi et al.*, Fig. 1).

In reference to claims 17: *Beigi et al.* teaches a computer for content-based searching of stored data (see *Beigi et al.*, column 1, lines 5-11). The method includes the steps of:

- Identifying segments in the audio data (see *Beigi et al.*, column 1, line 12-16);
- Developing a probability distribution function for each of the audio segments from data points within each of the segments (see *Beigi et al.*, column 1, lines 53-63);
- Developing distance measure between a probability density function of a chosen data segment and probability distribution function for the audio sample segments (see *Beigi et al.*, column 1, lines 53-56);
- Applying a threshold to the developed distance measure to identify segments with distance measure relative to the chosen data segment (see *Beigi et al.*, column 7, lines 8-11) that is below a pre-selected threshold value where the distance is directly computed according to a measure that guarantees to satisfy the non-negative-ness (see *Beigi et al.*, column 5, equation 1, distance measure carried out in absolute value), symmetry

(see *Beigi et al.*, column 5, equation 2 guarantees that a transpose metrics provide a symmetry property hence no transpose matrix can be carried out without the symmetrical property), and triangular inequality properties of a distance measure (see *Beigi et al.*, column 5, lines 9-11, Euclidian distance measurement guarantees triangular inequality).

With regard to claim 18: as noted above in claim 17, *Beigi et al.* further teaches that the chosen segment is a provided data segment (see *Beigi et al.*, column 1, lines 47-53).

With regard to claim 19: as noted above in claim 17, *Beigi et al.* further teaches that the stored data is audio data (see *Beigi et al.*, column 1, lines 47-63, applicant's invention provides audio signal processing within audio-video signal, no video signal or spectrum of colors are processed).

With regard to claim 20: as noted above in claim 17, *Beigi et al.* further teaches that the stored data includes segments that carry speeches of a speaker (see *Beigi et al.*, column 1, lines 5-11).

With regard to claim 21: as noted above in claim 20, *Beigi et al.* further teaches that the speaker characterizes the segment where the speaker influences (pre-dominates) an audio signal associated with the segment (see *Beigi et al.*, column 6, lines 43-48).

With regard to claim 22: as noted above in claim 20, *Beigi et al*. further teaches that the chosen segment carries a speech of a particular speaker (see *Beigi et al*., column 6, lines 44-46)

With regard to claim 23: as noted above in claim 17, *Beigi et al*. teaches an audio signal processing; however, it does not say that the data is extracted from a television program. Nevertheless, the idea of the invention is claiming an audio signal-processing scheme and it is inherent to show that the speaker or the speech extracted for further test of collection or model can come from a television or video signal because a video or television signal consists of a separate audio signal track.

With regard to claim 24: as noted above in claim 17, *Beigi et al*. teaches a method of computing a distance measure between multiple mixtures type probability distribution functions (see *Beigi et al*., Figs. 1-3 and Abstract). The method includes the steps of evaluating a joint distribution function (see *Beigi et al*., Figs. 4A and 4B, and column 2, lines 32-37). As the sum value of μ_I and γ_k over the range of I=1 to N and k=1 to K equate to a value one is simply showing that the outcome of the sum of probability of events is always one.

In reference to claim 25: as noted above in claim 24, *Beigi et al*. further teaches that the method executed in a computer includes the steps of:

- Identifying speaker segments in audio data based on speech contained in the data (see *Beigi et al*., column 1, line 12-16);

- Developing a probability distribution function for each of the segments from data points within each of the segments (see *Beigi et al.*, column 1, lines 53-56); and
- Developing distance measures among the probability distribution functions, where each of the measures is obtained through one-pass evaluation of a function that guarantees the non-negative-ness (see *Beigi et al.*, column 5, equation 1, distance measure carried out in absolute value), symmetry (see *Beigi et al.*, column 5, equation 2 guarantees that a transpose metrics provide a symmetry property hence no transpose matrix can be carried out without the symmetrical property), and triangular inequality properties of a distance measure (see *Beigi et al.*, column 5, lines 9-11, Euclidian distance measurement guarantees triangular inequality).

With regard to claim 26: as noted above in claim 25, *Beigi et al.* further teaches a method of computing a distance measure between multiple mixtures type probability distribution functions (see *Beigi et al.*, Figs. 1-3 and Abstract). The method includes the steps of evaluating a joint distribution function (see *Beigi et al.*, Figs. 4A and 4B, and column 2, lines 32-37). As the sum value of μ_I and γ_k over the range of I=1 to N and k=1 to K equate to a value one is simply showing that the outcome of the sum of probability of events is always one.

Response to Argument

7. As noted above, the Examiner still maintains the 35 U.S.C. 101 rejections as it applies to claims 13-16. Further, claims 1 and 5 are objected to because of minor informalities noted in the previous office action.

In reference to claims 1-16: Applicant has indicated that the distance measurement between the probability density functions is carried out using *Kullback Leibler Distance*. *Beigi et al*. in column 5, lines 20-34 shows that the distance between the probability density functions also can be computed using *Kullback Leibler Distance*. The measurement method includes inter-collection distance with a weighted sum of multiple distances (see *Beigi et al*., column 5, lines 35-47); hence the measurement includes distances between each member and all of the other elements. Further, the method is used to carry out speaker classification or voice data (see *Beigi et al*., Abstract). Therefore, Applicant's assertion that *Beigi et al*. reference fails to show *Kullback Leibler Distance* is not considered persuasive.

Conclusion

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Elias Desta whose telephone number is (703)-305-3840. The examiner can normally be reached on M-Thu (8:00-6:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marc S. Hoff can be reached on (703)-308-1677. The fax phone numbers for the organization where this application or proceeding is assigned are (703)-308-5841 for regular communications and (703)-308-5841 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)-308-1782.

Elias Desta
Examiner
Art Unit 2857

-ed

October 16, 2003

MARC S. HOFF
SUPERVISORY PATENT EXAMINER
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